PAPER CHROMATOGRAPHY LAB

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**What is Chromatography?**

Chromatography is a method for analyzing complex mixtures (such as ink) by separating them into the chemicals from which they are made. Chromatography is used to separate and identify all sorts of substances in police work. Drugs from narcotics to aspirin can be identified in urine and blood samples, often with the aid of chromatography.

**Purpose:**

To identify what pen was used to write the note by analyzing various pen ink chromatography. To learn the process of chromatography and have an understanding of it.

**Materials**:  
4 black pens  
Several sheets of chromatography paper (coffee filter)  
Small glasses or plastic containers  
Isopropyl rubbing alcohol\* (ethanol)  
Pencils  
Tape  
Scissors  
Stapler

The written note

The chromatography of ink on note.

**Part I - Separating Black Ink**  
**1.** Cut several coffee filters into long strips, one strip per pen.  
**2.** Fold the end of each strip over then staple it to form a loop.  
**3.** Place a dot of ink near the bottom of each strip. Use a pencil to identify which strip belongs to which pen.

**4.** Poke a pencil through one of the loops you just made. Use the pencil to suspend the strip in a small glass or container.  
**5.** Carefully add ethanol to the glass until it reaches the bottom of the paper strip just below the ink dot. Be sure the ink stays above the ethanol and the paper stays in the water.  
**6.** Allow the ethanol to soak up the strip and watch what happens to the ink drop.  
**7.** Repeat this process for each strip and compare your results.  
**8.** Let the strips dry and tape them on a sheet of paper as a record of the different pen types.

9. Compare your results with the ink from the secret note chromatography. Make an assumption of what pen was used to write the note.­

Because molecules in ink and other mixtures have different characteristics (such as size and solubility), they travel at different speeds when pulled along a piece of paper by a solvent. For example, black ink contains several colors. When the alcohol flows through a word written in black, the molecules of each one of the colors behave differently, resulting in a sort of “rainbow” effect.  
     Many common inks are water soluble and spread apart into the component dyes using alcohol as a solvent. If the ink you are testing does not spread out using alcohol, it may be “permanent” ink.

Questions:

1. What is the difference between a mixture and a compound?
2. Explain how chromatography works.
3. Explain why you chose the pen you did to be the owner of the teacher.
4. Explain how chromatography is used.
5. Why didn’t we want the ink dot to touch the alcohol?